ART. VIII. THE CANADIAN FORMS OF THE SHARP-TAILED SPARROW, *AMMOSPIZA CAUDACUTA*

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A few months after Mr. W. E. Clyde Todd described a new race of sharp-tailed sparrow from James Bay,* Dr. H. C. Oberholser wrote to me expressing his doubts as to the distinctness from *nelsoni* of Mr. Todd's bird, requested information about the co-types of *nelsoni* in the Museum of Comparative Zoölogy and sent specimens representing his conception of the two interior races of sharp-tailed sparrows for comparison with the co-types. My belief at that time was that *altera* was the same as *nelsoni* and that the bird of the Prairie Provinces of Canada was something else. Just how this decision was reached will be explained further on. After hearing from me, Dr. Oberholser took up the question with Mr. Todd, whom he did not entirely convince.

During the spring of 1939, Mr. Todd visited Cambridge and together we went over more of his James Bay material along with the co-types of *nelsoni* and other specimens. I was not inclined to recede from my original opinion; Mr. Todd was not entirely willing to yield his ground and thus the matter rested until 1941 when he sent me additional new material, breeding birds in fresh plumage from James Bay, suggesting that in view of the variability of a series from a given locality that further investigation was desirable.

I therefore set about to amass good series of breeding sharp-tails from the range of this species in the interior of North America to supplement the rather meagre representation in the Museum of Comparative Zoölogy. Specimens from North Dakota were loaned by the Fish and Wildlife Service; the National Museum of Canada (through Mr. P. A. Taverner) supplied skins from Alberta, Saskatchewan, Manitoba, and Quebec; the Royal Ontario Museum of Zoology (through Mr. L. L. Snyder) sent their series from Alberta, Saskatchewan, Manitoba, Ontario, and Quebec as well as some migrants from points within the United States; the Carnegie Museum (Mr. W. E. C. Todd) provided a nice series from Saskatchewan,

Ammospiza caudacuta altera Todd, Auk, 55, 1938, p. 117.

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the entire James Bay series and a run of migrants from Erie County, Pennsylvania. Dr. Wetmore of the United States National Museum authorized the loan of the type of *becki*, Ridgway. Dr. J. Van Tyne supplied some interesting specimens from the collection of the University of Michigan's Museum of Zoology and from the collection of Dr. Max M. Peet.

This array of material when spread out shows two well marked forms; a more generally distributed western one extending from northern Alberta to southeastern Manitoba and south to North Dakota and northwestern Minnesota, and a more local form inhabiting the salt marshes at the southern end of James Bay. This last form is cut off from its western relative by an area some 600 miles wide in which no form of sharp-tailed sparrow is known to occur; from Kamouraska, Quebec, the nearest known colony of *subvirgata*, the James Bay population is segregated by 475 miles of Quebec wilderness.

There are several points that must be constantly borne in mind when dealing with *Ammospiza caudacuta*. The first of these is that the plumage abrades very rapidly and the more the birds become worn the more the races resemble one another; birds shot during July are not entirely satisfactory for comparison; those taken after August first are practically useless for this purpose. Second, the species has two complete moults annually, so that fresh plumage may be observed from some time in September to the end of November; then ensues a gradual obscuring of characters through wear, followed by a moult in late March and April, resulting in the attainment of nuptial plumage by May. Third, there is much variation in comparable series from any given locality, chiefly observable in a greater or lesser amount of streaking beneath, the depth of the buff markings on the sides of the head, and the shade of reddish brown on the wing coverts.

I can discover no correlation between these types of color variation that might be associated with either geography or sex, and efforts to correlate them with age have failed since the number of birds taken in the autumn whose age has been determined, on condition of the skull by the collector, as adult or immature is very small, and it is of course not practicable to attempt to "age" birds in the spring.

The extent of individual variation coupled with the uncertainty as to whether there is any difference between adult winter and immature first winter plumage complicates the situation of the allocation of the types of *nelsoni*; these were taken in September or October, probably as migrants,

on the Calumet marshes, near Chicago, and the sex was not determined in either case. In view of what is now known, their allocation as representing the James Bay population or the Prairie Province populations could not be any too certain with the material available in 1939, nor without a better understanding of the individual and seasonal variations of the two races than I possessed at that time.

While it is hardly correct to say that *Ammospiza caudacuta* has two color phases, it is essential to distinguish a more rufescent type and a less rufescent type. Taken in conjunction with the rapid wear of plumage, comparisons between series from different localities should be made only with birds strictly comparable in degree of abrasion and the same degrees of rufescence. This process of sorting and re-sorting skins eventually cuts down the amount of material that may be taken under consideration for final conclusions, but it seems the most reliable course. After extensive winnowing in the manner set forth above, it is now my definite opinion that the co-types of *nelsoni* are based on *less rufescent* examples of the breeding bird of the prairies and that Mr. Todd's *altera* is the name of the localized James Bay race.

To understand the relationships of *altera* it is also necessary to have a clear idea of the variation of *subvirgata*, and for that reason a summary of the characters and plumages of the latter race is given in the following synopsis of the interior races.

Ammospiza caudacuta subvirgata (Dwight)

Ammodramus caudacutus subvirgatus Dwight, Auk, 4, 1887, p. 223, (Hillsborough, Albert Co., New Brunswick). Type in American Museum of Natural History; not examined.

Nuptial plumage, male and female.—The general effect above is that of a greenish olivaceous gray; coronal stripe relatively broad, enclosed laterally by a stripe of brownish feathers with dark centers; scapulars conspicuously edged with ashy or pale gray (never with white); feathers of back with conspicuous dark centers; rump unstreaked, upper tail coverts usually with narrow shaft lines; outer edgings of wing coverts and secondaries usually dull rusty; sides of head buffy with a conspicuous gray auricular patch and narrow dark postocular stripe; throat white or buffy with more or less distinct traces of a gray malar stripe; pectoral band and flanks buffy becoming more olivaceous on the flanks; breast invariably streaked, the streaks somewhat obscured by the buffy edges of the feathers; flank

streaks broader and more conspicuous; center of abdomen white; under tail coverts whitish to pale buffy.

In the more rufescent type, the sides of the head, edges of the secondaries, and greater wing coverts, are more richly colored and the dorsal feathers appear to have more extensive dark centers; this type shades through a long series of intermediates into the less rufescent type, characterized by paler and grayer coloration generally, a reduction of dark feather centers above, and scapular borders, contrasting less with the coloration of the upper parts.

As the breeding season advances and abrasion of the plumage becomes more pronounced, the brighter colors gradually wear away, the streaking across the breast is more fully revealed and the loral portion of the supraocular stripe becomes distinctly pale yellow; this last feature never seems to be the case either in *altera* or *nelsoni*.

First winter and adult winter plumage.—Similar to the nuptial plumage, but generally duller with less contrasting of colors above and the gray scapular borders, in some cases (first winter only?) so overrun with the ground color of the upper parts as to be very inconspicuous. The streaks across the breast appear to be broader and heavier.

Measurements.—Based on breeding examples only.

QUEBEC: 3 ♂, wing 55.9–58.9 (57.5); tail 47.8–50.3 (49.1); bill 11.7–12.1 (11.9).
PRINCE EDWARD ISLAND (all worn August birds): 4 ♂, wing 55.9–56.8 (56.25); tail 46.0–49.9 (47.9); bill 11.7–13.0 (12.45).
NOVA SCOTIA (males all worn August birds, females fresh): 4 ♂, wing 56.1–57.5 (56.8); tail 44.9–51.6 (48.2); bill 11.0–12.1 (11.5).
3 ♀, wing 53.7–53.9 (53.8); tail 46.1–50.6 (48.7); bill, 11.5–12.2 (11.9).

Range.—Breeds in the tidal marshes of the lower St. Lawrence River (Kamouraska), Prince Edward Island, Magdalen Islands?, Nova Scotia, New Brunswick and eastern Maine. Winters regularly on the coastal marshes from South Carolina to northern Florida; casually farther north. On migration along the Atlantic seaboard; casual (?) in the lower Hudson Valley (Sing Sing).

Specimens examined.—All in Museum of Comparative Zoölogy except where noted.

QUEBEC: KAMOURASKA, 1 ♂, June 22, 1936 (R.O.M.Z.); 1 ♂, June 23, 1941 (R.O.M.Z.); 1 ♂, July 1, 1932 (Nat. Mus. Canada).
NEW BRUNSWICK: HAMPTON, 2 ♂, June 21, 1881; WICKHAM, 1 ♀, August 1, 1911.
PRINCE EDWARD ISLAND: 1 ♂, August 2, 1873 (C.F.B.); 3 ♂, August 3, 1876.

NOVA SCOTIA: BARRINGTON, 3 ♂, August 2, 1907; 1 ♂, 1 juv. ♂, August 3, 1907 (all A. C. B.); WOLFVILLE, 2 ♀, June 28, 1926; 1 ♀, June 30, 1926.

MAINE: SCARBORO, 1 ♂, May 22, 1897.

MASSACHUSETTS: PLUM ISLAND, 1 not sexed, Oct. 13, 1919 (J.L.P.); IPSWICH, 1 ♀, Nov. 2, 1884 (A.C.B.); 1 imm. —, Oct. 2, 1922; 1 ad. ♂, 2 imm. ♂, 2 imm. ♀, Oct. 22-23, 1922; 1 imm. ♀, Sept. 22, 1924 (all J. L. P.); SAUGUS, 6 ♂, 3 ♀, 1 not sexed, Oct. 9, 1890; 1 ♂, 1 ♀, May 29, 1893; 2 ♂, Sept. 23, 1893; SWAMPSCOTT, 1 ♂, Nov. 5, 1881; REVERE, 1 ♂, May 24, 1879; 1 ♂, 1 ♀, Oct. 17, 1885 (C.F.B.); 1 ♂, 2 ♀, Oct. 23, 1888; 2 ♂, 2 ♀, Oct. 24, 1885; 1 ♂, Oct. 28, 1888; 1 not sexed, Oct. 1888; 1 not sexed, Oct. 8, 1889; 5 ♂, 1 ♀, 1 not sexed, May 26, 1890; 1 not sexed, May 31, 1890; 1 ♂, 1 ♀, Sept. 3, 1890; 1 ♂, Oct. 8, 1891; EAST WATERTOWN, 1 ♂, June 1, 1869; CAMBRIDGE, 1 ♀, Oct. 7, 1869; 1 ♂, Oct. 10, 1869; 2 ♂, 1 ♀, Oct. 9, 1871; SOUTH DUXBURY, 1 ♂, Nov. 1, 1885; PLYMOUTH, 1 ♂, May 28, 1911; 1 ♂, May 30, 1913; 1 ♂, 2 ♀, May 25, 1922; 2 ♂, May 28, 1931; WAREHAM, 2 ♀, Sept. 28, 1884; WESTPORT POINT, 1 ♀, June 2, 1916 (A.C.B.).

NEW YORK: SING SING, 1 ♂, Oct. 1, 1880; 1 ♂, Oct. 7, 1885; 1 ♂, Sept. 29, 1886.

SOUTH CAROLINA: MOUNT PLEASANT, 1 ♂, Oct. 10, 1885; 2 ♂, Nov. 30, 1889; 1 ♂, Dec. 13, 1890; 1 ♂, Jan. 24, 1891; 4 ♂, Feb. 7 and 11, 1891; 1 ♀, Oct. 21, 1891; 1 ♀, Nov. 4, 1891; 1 ♂, 1 ♀, Feb. 1 and 2, 1893; 2 ♂, Oct. 23 and 26, 1893; 1 ♂, Nov. 16, 1895; 1 ♂, Dec. 22, 1896; 3 ♂, May 9 and 22, 1899; 1 ♂, May 25, 1900; 2 ♂ (1, R.O.M.Z.), 1 ♀, May 26, 1900; 1 ♂, Dec. 2, 1911; 1 ♂, Jan. 21, 1915 (A.C.B.); 1 ♂, 1 ♀, Feb. 1 and 6, 1915 (A.C.B.); 1 ♂, May 29, 1915; 1 ♂, May 17, 1920 (A.C.B.); NEAR FROGMORE, 1 ♂, 1 ♀, Mar. 19, 1896; 1 ♀, April 20, 1896.

GEORGIA: CAMDEN CO., 1 ♀, April 4, 1877.

FLORIDA: AMELIA ISLAND, 1 ♀, May 18, 1906; 1 ♀, Dec. 1, 1906 (both R.O.M.Z.); NASSAU CO., 1 ♂, 1 ♀, Feb. 2, 1914 (F.H.K.).

Ammospiza caudacuta altera Todd

Ammospiza caudacuta altera Todd, Auk, 55, 1938, p. 117 (East Main, James Bay, Quebec). Type in Carnegie Museum; examined.

Nuptial plumage, male and female.—Similar to *A. c. subvirgata*, but with general tone of upper parts more brownish, less grayish, the scapular borders paler gray, sometimes pure white; streaks on breast more variable, sometimes lacking, but when present narrower and better defined.

First winter and adult winter plumage.—Exceedingly close to the corresponding plumage of *subvirgata*, in fact I can find no characters that will definitely separate the more rufescent specimens of *subvirgata* from the less rufescent specimens of *altera;* the latter form usually presents a slightly more contrasting appearance above and the breast streaks of *subvirgata*

average heavier. Phase for phase *altera* is more richly colored than *subvirgata;* the more rufescent type predominates; the loral spot never becomes yellow in worn summer plumage.

Size about the same as that of *subvirgata.*

Measurements.—Based on breeding birds only.

JAMES BAY: 12 ♂, wing 52.6*–59.5 (57.7), tail 49.4*–53.7 (51.1), bill 11.1*–12.5 (11.9).

3 ♀, wing 54.6–57.5 (55.8), tail 45.9–50.5 (47.7), bill, 11.4–11.6 (11.5).

Range.—Breeds locally in the marshes about the southern shore of James Bay from Moosonee to East Main, and north on the west shore at least to the mouth of the Attawapiskat River. Winters along the Atlantic coast from South Carolina to Florida (one record for Louisiana). On migration recorded from the southern shore of Lake Erie, the lower Hudson Valley, and the coast of Massachusetts.

Specimens examined.—All in Carnegie Museum except where noted.

QUEBEC: (JAMES BAY), EAST MAIN, 1 ♂, June 29, 1926 (Type).

ONTARIO: (JAMES BAY), SANDY ISLAND, 1 ♂, 1 imm. ♂, 1 juv. ♂, Sept. 3, 1923; BIG STONE, 1 ♀, June 26, 1912; PARTRIDGE CREEKS, 2 ♂, 1 ♀, Sept. 6, 1923; 1 ♂, Sept. 13, 1927; 3 ♂, 1 imm. ♂, Sept. 15, 1923; 2 ♂, June 12, 1941; 3 ♂, June 13, 1941; 2 ♂, June 10, 1941; NATTABISHA POINT, 1 ♂, 1 ♀, June 17, 1941; 1 ♂, June 18, 1941; MISSISSIKABE RIVER, 1 ♂, June 25, 1941; GULL POINT, 1 ♀, Sept. 21, 1935; MOOSE FACTORY, 1 ♂, July 5, 1908; MOOSONEE, 3 ♂, July 8, 1939 (R.O.M.Z.); 1 ♂, July 12, 1939 (R. O. M. Z.); ATTAWAPISKAT POST, 1 ♀, Aug. 3, 1939 (R.O.M.Z.); 1 juv. ♂, Aug. 8, 1938 (R.O.M.Z.).

OHIO: RICHMOND, LAKE CO., 1 not sexed, Sept. 29, 1931 (Cleveland Museum).

PENNSYLVANIA: PRESQUE ISLE, ERIE CO., 1 ♂, 1 imm. ♂, 2 imm. ♀, Sept. 25, 1900; 1 imm. ♂, Oct. 2, 1900.

NEW YORK: SING SING, 1 ♂, Sept. 30, 1880; 1 ♂, Oct. 17, 1885; 1 ♀, Oct. 4, 1888; LONG ISLAND, 1, no data (all M.C.Z.).

MASSACHUSETTS: SWAMPSCOTT, 1 ♀, Nov. 2, 1878; 1 ♂, Oct. 25, 1879 (both M.C.Z.).

SOUTH CAROLINA: MT. PLEASANT, 1 ♀, Feb. 9, 1891; 1 ♂, Jan. 31, 1893; 1 ♂, Dec. 6, 1896; 2 ♂, May 15 and 28, 1897; 1 ♂, 1 ♀, May 22 and 24, 1899; 1 ♂, May 28, 1900 (all M.C.Z.); 1 ♂, Dec. 6, 1911 (A.C.B.).

GEORGIA: SAPELO ISLAND, 1 ♀, Dec. 14, 1887 (M.C.Z.).

*The minima for wing, bill and tail were all taken from the same specimen (Carnegie Mus., K. W. Haller, orig. no. 1150), evidently an abnormally small bird; if these minima are disregarded the next smallest are wing 56.0, tail 49.8, bill 11.3.

Ammospiza caudacuta nelsoni (J. A. Allen)

Ammodramus caudacutus var. *nelsoni* J. A. Allen, Proc. Boston Soc. Nat. Hist., 17, 1875, p. 293 (Calumet Marshes, Cook Co., Illinois), co-types in Museum of Comparative Zoology; examined.

Ammodramus caudacutus becki Ridgway, Proc. U. S. Nat. Mus., 14, 1891, p. 483 (Milpitas, Santa Clara Co., California), type in U. S. National Museum; examined.

Nuptial plumage, male and female.—Distinguishable at a glance from *subvirgata* and *altera* by its smaller size and darker coloration above; there is a great extension of the dark areas, brown tones predominate; the gray coronal stripe is darker and narrowed by an invasion of the dark borders of the crown; scapular edgings pure white or very pale gray, broader than in the other two races; sides of head more richly colored and in the most rufescent examples this color overruns the gray auricular patch so that it is not contrasted against the buffy background. Streaking below variable, often absent, but when present is "penciled" in appearance.

First winter and adult winter plumage.—Less readily distinguishable from *altera* than in the preceding plumage, but averaging browner in series, coronal stripe narrower and scapular borders rather paler; streaks across breast darker, narrower and more sharply defined.

Measurements.—Based on breeding birds only.

ALBERTA: 11 ♂, wing 55.0–58.1 (55.9); tail 43.6–49.6 (47.2); bill 11.2–12.6 (11.9).
1 ♀, wing 55.5; tail 47.5; bill 12.3.

SASKATCHEWAN: 14 ♂, wing 53.0–57.5 (55.9); tail 45.6–50.8 (47.7); bill 11.6-12.6 (11.9).
3 ♀, wing 52.5–53.7 (53.0); tail 43.4–45.9 (43.9); bill 11.9–12.3 (12.1).

MANITOBA: 11 ♂, wing 53.9–57.7 (56.2); tail 42.9–51.0 (46.5); bill 11.1–12.3 (11.9).
2 ♀, wing 51.8–52.5 (52.1); tail 45.5–45.6; bill 12.0–12.2 (12.1).

NORTH DAKOTA: 13 ♂, wing 54.0–57.0 (55.6); tail 43.5-53.3 (47.4); bill 11.3–12.4 (11.9).
4 ♀, wing 52.5–55.2 (53.5); tail 43.6–46.5 (44.8); bill 11.5–12.3 (12.1).

Co-types of *nelsoni*

M.C.Z. 24,407, not sexed, wing 55.7; tail 49.6, bill 11.4. 24,408, not sexed, wing 54.8; tail 46.8, bill 11.

Type of *becki*

U. S. Nat. Mus. 120,310, not sexed (= ♀ by measurement), wing 53.5; tail 46.7; bill 10.8.

Range.—Breeds in the fresh water prairie marshes from extreme west central Alberta (Peace River Landing), southern Mackenzie (Great Slave Lake), central Saskatchewan (Emma Lake) and central Manitoba (north to The Pas and Sturgeon Creek) south to south-central Alberta (Red Deer), southern Saskatchewan (Last Mountain Lake, Yorkton), no record for Montana, southeastern North Dakota (chiefly east of the 100th Meridian), (northeastern South Dakota *fide* A. O. U.), and northwestern Minnesota (Kittson and Marshall counties); possibly bred formerly near Chicago, Illinois, but reports of its breeding there unsubstantiated, as are also similar reports from eastern Kansas and from Lake Koshkonong and the Horicon Marshes, Wisconsin. Winters in the salt marshes of the Atlantic and Gulf Coasts from South Carolina (occasionally North Carolina ?) to Texas, south to Merritts Island and Tampa Bay on the Florida peninsula (casual at Cape Sable), and to Corpus Christi, Texas.

Migrates down the Mississippi Valley and southeastward through southern Ontario, reaching the Atlantic coast as far north as Maine; no spring records on the Atlantic coast north of Staten Island. Recorded as a transient in the following states (in addition to those mentioned above or from which specimens are listed): Nebraska, Iowa, Missouri, Arkansas, Tennessee, Indiana, Vermont, Maine, Rhode Island, Connecticut, New Jersey, Maryland, Virginia, and District of Columbia.

The extreme southeastern boundary of the breeding range of *nelsoni* is given in the fourth edition of the A. O. U. Check-List as northeastern South Dakota. I am unable to find on what basis this statement is made.

The southernmost example examined is a bird from the collection of Dr. Max Minor Peet, collected by J. C. Howell at Cape Sable, Florida, Dec. 22, 1932. This bird is interesting in more ways than one since it contains such an accentuation of the dark markings as to constitute a partial melanism; the crown is entirely black; the dark areas on the back are greatly extended and the flanks are broadly streaked with black. It is a typical *nelsoni* in size, with a wing 55.4; tail 45.9; and bill 12.8 (a little long). I regard this bird as an aberrant *nelsoni;* it is inconceivable that there should be an isolated colony at Cape Sable.

The type of *becki* was collected by Rollo H. Beck at Milpitas, Santa Clara Co., California, on May 6, 1891. The specimen is of the more rufescent type, with the auriculars overrun by the color of the sides of the head; the pectoral band is marked with a few short, narrow, dark brown shaft lines.

As previously stated in this paper, the co-types of *nelsoni* appear to be specimens in the less rufescent phase of this form; in measurements also they conform to those of the Prairie bird and not to the larger James Bay race.

Specimens examined.—All in Museum of Comparative Zoölogy except where stated.

ALBERTA: Peace River Landing, 1 ♂, June 20, 1903 (Nat. Mus. Canada); Slave River, 1 ♂, June 12, 1901 (Biol. Surv.); 15 miles N.W. of Chipewyan, 1 ♂, July 7, 1920 (M.C.Z.); Athabaska Delta, 1 ♂, 1 not sexed, June 15, 1920 (Biol. Surv.); 1 ♀, June 19, 1920; 1 ♂, June 20, 1920 (both M.C.Z.); 2 ♂ June 22, 1920 (Biol. Surv.); 1 ♂, July 11, 1920 (M.C.Z.); Lac la Nonne, 1 ♂, June 30, 1926; 1 ♂, July 13, 1926; 1 juv. ♂, 1 juv ♀, Aug. 4, 1926; 1 imm. ♂, Beaver Hill Lake, Aug. 24, 1925 (all Nat. Mus. Canada); Camrose, 1 ♂, Sept. 6, 1929 (R.O.M.Z.); Red Deer, 1 ♂, June 20, 1906 (R.O.M.Z.).

SASKATCHEWAN: Emma Lake, 1 juv. ♂, July 14, 1939 (R.O.M.Z.); Elstow, 1 ♂, May 21, 1936 (M.M.P.); Last Mountain Lake, 1 ♀, July 15, 1920 (Nat. Mus. Canada); 12 ♂, 1 ♀, May 24–June 17, 1932 (Carnegie Mus.); Kutawagan Lake, 1 ♂, 1 ♀, June 4-5, 1920 (Nat Mus. Canada).

MANITOBA: The Pas, 2 ♂, June 8-10, 1937 (Nat. Mus. Canada); Lake Winnepegosis, 1 ♀, June 9, 1913 (A.C.B.); Lake St. Martin Indian Reservation, 1 ♂, June 22, 1934; Sturgeon Creek, juv. ♂, Sept. 9, 1931 (both R.O.M.Z.); Dauphin, 1 ♀, June 22, 1938; Shoal Lake, 1 ♀, Sept. 21, 1917, 1 ♂, June 13, 1918; 1 ♀, Sept. 10, 1918; Oak Lake, 2 ♂, July 14, 1921; 1 imm. ♂, Sept. 13, 1921; Whitewater Lake, 1 ♂, June 5, 1925; Douglas, 1 ♂, May 22, 1916 (all Nat. Mus. Canada); Rosser, 1 ♂, June 30, 1 ♂, July 20, 1 juv., Sept. 10, 1932; Vivian, 1 ♂, July 12, 1932 (all R.O.M.Z.).

ONTARIO: Toronto, 1 not sexed, Sept. 22, 1894; 1 ♀, Oct. 28, 1896; 1 ♀, Oct. 9, 1897 (R.O.M.Z.).

CALIFORNIA: Milpitas, 1 not sexed, May 6, 1891 (type of *becki*, Ridgway).

NORTH DAKOTA: (all in coll. U. S. Biol. Surv.), Towner, 1 ♂, 1 ♀, 1 not sexed, July 24-25, 1915; Fort Totten, 1 ♂, 1 ♀, July 12, 1915; Larimore, 2 ♂, June 23-24, 1915; Dawson, 3 ♂, 1 ♀, July 27, 1915; 1 imm. ♀, Sept. 6, 1922; Oakes, 1 ♂, June 26, 1915; Ludden, 1 ♂, June 14, 1912; Spring Lake, 1 ♂, 1 ♀, July 7, 1915; Lidgerwood, 1 ♂, June 14, 1915; Hankinson, 2 ♂, July 21-22, 1912.

KANSAS: Neosho Falls, 1 not sexed, Oct. 19, 1881.

WISCONSIN: Lake Koshkonong, 4 ♂, Sept. 17-24, 1893; 7 ♂, Sept. 7-24, 1894 (one, U. of Mich); 2 ♀, Sept. 23, 1897 (1 R.O.M.Z., 1 M.C.Z.); 1 ♂, Oct. 2, 1898 (R.O.M.Z.).

MICHIGAN: Jackson Co., 1 ♀, Sept. 23, 1934; 1 ♀, Oct. 16, 1935; 1 ♂, Oct. 4, 1936; 1 ♂, Sept. 30, 1939; Monroe Co., 1 ♀, May 29, 1939; Wayne Co., 1 ♂, Sept. 27, 1893 (all U. of Mich.).

ILLINOIS: near Chicago (*i.e.* Calumet Marshes), 2 not sexed, Oct. 1874 (co-types of *nelsoni*); Chicago, 1 ♂, May 27, 1922 (M.M.P.); Ainsworth, 1 ♂, Sept. 17, 1874; Warsaw, Oct. 11, 1883; Grand Crossing, 1 ♂, Oct. 29, 1893.